

stations; the highest and lowest water for September, 1889, with the dates of occurrence and the monthly ranges:

Heights of rivers above low-water mark, Sept., 1889, (in feet and tenths).

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>						
Shreveport, La.	29.9	30	18.8	4, 10	4.3	14.5
<i>Arkansas River:</i>						
Fort Smith, Ark.	22.0	14	9.0	8	2.2	6.8
Little Rock, Ark.	23.0	17	10.2	1	4.2	6.0
<i>Missouri River:</i>						
Fort Buford, Dak.		7	0.3	1	-1.0	1.3
Omaha, Nebr.	18.0	1, 2	5.8	29, 30	5.1	0.7
Leavenworth, Kans.	20.0	1	7.0	30	4.8	2.2
Kansas City, Mo.	21.0	17	7.7	30	4.5	3.2
<i>Mississippi River:</i>						
Saint Paul, Minn.	14.5	1, 3	3.2	29, 30	1.9	1.3
La Crosse, Wis.	24.0	2	4.4	30	2.4	2.0
Dubuque, Iowa.	16.0	5	3.9	29	2.2	1.7
Davenport, Iowa.	15.0	5, 6, 7	2.3	23 to 30	1.3	1.0
Keokuk, Iowa.	14.0	14, 15	2.0	28	0.5	1.5
Saint Louis, Mo.	32.0	17, 18	8.2	30	5.2	3.0
Cairo, Ill.	40.0	10	14.4	4	7.1	7.3
Memphis, Tenn.	34.0	12, 13	11.0	5	6.1	4.9
Vicksburg, Miss.	41.0	18	11.7	10	6.8	4.9
New Orleans, La.	13.0	19	5.7	11, 12, 13, 27	3.7	2.0
<i>Ohio River:</i>						
Pittsburgh, Pa.	22.0	19, 24	6.5	2	0.2	6.3

Heights of rivers—Continued.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Ohio River—Cont'd.</i>						
Parkersburg, W. Va.	38.0	24	4.4	8	1.7	2.7
Cincinnati, Ohio.	50.0	30	13.0	13	5.3	7.7
Louisville, Ky.	25.0	30	5.8	15, 16	3.6	2.2
<i>Cumberland River:</i>						
Nashville, Tenn.	40.0	11	13.0	1	3.0	10.0
<i>Tennessee River:</i>						
Chattanooga, Tenn.	33.0	19	8.0	17	2.4	5.6
<i>Monongahela River:</i>						
Pittsburgh, Pa.	29.0	19, 24	6.5	2	0.2	6.3
<i>Savannah River:</i>						
Augusta, Ga.	32.0	25	19.3	17, 18, 19	6.8	12.5
<i>Willamette River:</i>						
Portland, Oregon.	15.0	10	3.9	19	0.2	3.7

Mississippi River.—Saint Paul, Minn.: the steamer "Sidney" left this port for Saint Louis on the 26th. The water in the river is very low, and this is considered the last boat of the season.—*Report of P. F. Lyons, observer, Signal Corps.* Dubuque, Iowa., 29th: the water in the river is so low above this city that navigation will have to be suspended for the season.—*Report of S. C. Emery, observer, Signal Corps.*

ATMOSPHERIC ELECTRICITY.

AURORAS.

Auroras were observed during the month as follows: 3d, Blue Knob, Pa. 4th, Davenport, Iowa. 5th, Lyons, N. Y. 8th, Mount Washington, N. H. 10th, Webster, Dak. 18th, Leech Lake, Dak.; Saint Vincent, Minn. 21st, Carson, Iowa; Bernier Springs, Mich. 22d, Eastport, Me.; Lyons, N. Y.; Clarksburgh, W. Va. 23d, Nashua, N. H. 25th, Webster, Dak.; Manitowoc, Wis. 27th and 28th, Webster, Dak.

Mount Washington, N. H., 8th: the cloudy condition of the sky lifted at 9 p. m., disclosing an auroral arch, having altitude 18°, and azimuth about 75°. The aurora consisted of a band of greenish light about 2° in width, resting on a dark segment, which in turn rested on the horizon. The display ended 11.10 p. m.—*Report of J. W. Bauer, observer, Signal Corps.*

Saint Vincent, Minn.: an auroral arch was observed from 11 p. m. 18th to 5.20 a. m. the following day. The arch rose to altitude 10°, and extended from azimuth 135° to 215°. Its maximum brilliancy occurred at midnight.—*Report of R. J. Boylan, observer, Signal Corps.*

Eastport, Me., 22d: an auroral arch which rose to altitude 15°, and extended from north-northeast to north-northwest, was observed from 9.10 p. m. to 10.30 p. m.—*Report of D. C. Murphy, observer, Signal Corps.*

THUNDER-STORMS.

The more severe thunder-storms of the month are described under "Local storms." Thunder-storms were reported in the greatest number of states and territories, twenty-one, on the 3d, 4th, and 15th; in twenty on the 2d; in from fifteen to eighteen, inclusive, on the 1st, 5th, 14th, and 16th; in from ten to fourteen, inclusive, on 6th to 13th, 17th, 18th, 19th, 21st, to 25th; in seven on the 20th; and in from two to four, inclusive, on the 26th, 28th, 29th, and 30th. The 27th was the only date on which no thunder-storm was reported.

Thunder-storms were reported on the greatest number of dates, twenty-three, in Florida; on twenty-one in Texas; on nineteen in Dakota; on eighteen in Louisiana; on seventeen in Kansas; on from ten to fifteen, inclusive, in Arizona, Arkansas, Georgia, Illinois, Indian Territory, Iowa, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New York, Pennsylvania, and Tennessee; on from five to eight, inclusive, in Alabama, Indiana, Maryland, Massachusetts, New Jersey, North Carolina, Ohio, Virginia, and Wisconsin; on from one to four, inclusive, in California, Colorado, Connecticut, District of Columbia, Kentucky, Maine, Montana, Nevada, New Hampshire, New Mexico, Oregon, Rhode Island, South Carolina, Utah, Vermont, Washington Territory, and Wyoming. No thunder-storms were reported in Delaware, Idaho, and West Virginia.

MISCELLANEOUS PHENOMENA.

DROUGHT.

Dubuque, Iowa: the rain storm on the afternoon of the 4th broke the drought which has prevailed in this section since July.—*Report of S. C. Emery, observer, Signal Corps.*

Fort Sully, Dak., 9th: the corn crop in this section is completely parched by the continued dry weather.—*Report of S. G. Gardiner, observer, Signal Corps.*

Vanceborough, Me., 9th: the eastern part of this state is now passing through one of the most severe droughts known for years. The brooks have entirely run dry, while the lakes and rivers have become low. Forests and vegetation are parched and dry.—*Portland, Me., Press, September 10.*

Montgomery, Ala., 17th: the weather for some days has

been very dry and hot. Through the country there is considerable complaint on account of the scarcity of water. The mills operated by steam and water power are unable to make full time for lack of water. The drought seems to be particularly severe in the country along the Western Railroad, as the passenger trains on the road have been delayed quite frequently, of late, because of the shortage in the water supply.—*The Daily Advertiser, Montgomery, Ala., September 17.*

Thornville, Mich., 30th: the drought which prevailed during the month of August has continued throughout this month. There has been some rain but not enough to make fall pasturage. Wells have failed more than in any previous year.—*Report of Mr. John S. Caulkins, voluntary observer.*